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Office of
Emergency and
Remedial Response

EPA/ROD/R09-90/055
September 1990

EPA

Superfund Record of Decision:

Operating Industries (Amendment), CA

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DECLARATION

SITE NAME AND LOCATION

Operating Industries, Inc. (OII)
Monterey Park, California

STATEMENT OF BASIS AND PURPOSE

This decision document presents an amendment to the remedial action selected on September 30, 1988 for the Gas Migration Control Operable Unit at the Operating Industries, Inc. site in Monterey Park, California. The amended remedy was chosen in accordance with CERCLA, as amended by SARA, and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This decision to amend the previously selected remedial action is based on the administrative record for this site operable unit.

The State of California concurs with the amended selected remedy.

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from this site, if not addressed by implementing the response action selected in this amended Record of Decision (ROD), may present an imminent and substantial endangerment to public health, welfare, or the environment.

DESCRIPTION OF THE AMENDED SELECTED REMEDY

The amended Gas Migration Control ROD at the OII site addresses the landfill gas (LFG) migration control and landfill cover. The major component of this amendment is the addition of landfill cover to the previously selected gas migration control remedy.

The major components of the Gas Migration Control ROD as amended include:

- Landfill cover designed to: (1) reduce surface gas emissions and odors; (2) prevent oxygen intrusion into the refuse; (3) prevent surface water infiltration; (4) provide erosion control; and (5) improve site aesthetics;

- o Perimeter LFG extraction wells, with placement focused on minimizing off-site LFG migration;

- o LFG extraction wells on the top deck of the landfill, with placement focused on maximizing source control of LFG;

- o Shallow and deep slope wells with placement focused on reducing surface emissions and controlling intermediate to deep subsurface migration at the perimeter;

- o Integrated above-grade LFG headers and condensate sumps;

- o LFG monitoring wells at the site boundary;

- o Upgraded thermal destruction facility for landfill gas; and

- o Pumps in appropriate gas wells, with above-grade collection sumps, to de-water saturated zones.

The amended gas control remedial action will be integrated with the two additional operable units, Site Control and Monitoring, and Leachate Management now being implemented.

STATUTORY DETERMINATION

The amended remedy selected is protective of human health and the environment, is designed to comply with Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action, or a waiver is justified, and is cost-effective. This remedy uses permanent solutions and alternative treatment technologies, to the maximum extent practicable. The gas control and landfill cover remedy selected by the amended decision document satisfies the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as a principal element.

As this remedy will result in hazardous substances remaining on-site above health-based levels, a review will be conducted each five years after the commencement of the final remedial action to ensure that the remedy continues to provide adequate protection of human health and the environment.

John Wise

Daniel W. McGovern for
Regional Administrator
EPA, Region IX

9.28.90
Date

AMENDMENT TO DECISION SUMMARY

OPERATING INDUSTRIES, INC.
GAS MIGRATION CONTROL OPERABLE UNIT
RECORD OF DECISION

SCOPE AND ROLE OF OPERABLE UNIT

The Gas Migration Control Operable Unit Record of Decision (hereinafter referred to as the "original gas ROD") at the Operating Industries, Inc. (OII) Superfund site in Monterey Park, California, is being amended to include the design and construction of landfill cover. EPA signed the original gas ROD for this operable unit on September 30, 1988. A copy of the original gas ROD is attached. EPA is addressing the problem of landfill gas (LFG) as an operable unit to expedite the LFG and cover remedial action prior to the selection and implementation of the overall final remedial action for the site.

Integration of the gas control remedy with landfill cover is preferred due to technical and economic advantages resulting from concurrent design and construction, and because an integrated approach will provide for protection of public health and the environment in a shorter time period. Landfill cover is required to: (1) reduce gaseous surface emissions and associated odor; (2) minimize oxygen intrusion into the refuse; (3) reduce surface water infiltration and the subsequent formation of leachate; (4) minimize slope erosion; and (5) improve site aesthetics.

The amended remedy retains the primary components of the original gas ROD; however, the addition of a landfill cover may affect certain elements of the design. For example, it is possible that a different number of wells than that specified in the original gas ROD will be necessary to control landfill gas. Similarly, factors such as well spacing, depth and type will be impacted by the addition of cover and will be reevaluated at the time of design.

The original gas ROD states that the decision to place landfill cover was deferred due to a lack of site-specific knowledge. Additional information about the existing landfill cover and refuse characteristics is now available as a result of the ongoing Remedial Investigation and EPA's experience from operation and maintenance of the landfill systems over the past three years (as part of the Site Control and Monitoring operable unit remedial action).

The addition of landfill cover is an amendment to the remedy selected for the third operable unit, Gas Migration Control, at the OII site. Two previous RODs for Site Control and Monitoring and Leachate Management were signed on July 31, 1987 and November 16, 1987, respectively. The ongoing Remedial Investigation

Feasibility Study (RI/FS) for the overall site remedy is currently scheduled for completion in 1993.

SITE DESCRIPTION

A site description is included in the original gas ROD. The following additional information is pertinent to the selection of landfill cover and its design.

More than 50 years of continuous rainfall data exist from two Los Angeles County Flood Control District (LACFCD) weather stations near the site. The average annual rainfall is approximately 16 inches, with a maximum annual rainfall of approximately 37 inches in 1982-3. Approximately 90 percent of the annual rainfall occurs during the 6-month period of November through April. The estimated probable maximum precipitation (PMP) is estimated to be about 21 inches for a 24-hour storm and 35 inches for a 72-hour storm (Bureau of Reclamation, 1974).

EPA estimates that the OII landfill settlement rates ranged from 3 to more than 4 feet per year between 1974 and 1983. Settlement rates observed from December 1987 to December 1988 were slightly greater than 2 feet per year. Additionally, the upper 10 to 30 feet of existing cover and refuse appear to be undergoing downslope creep at a rate of 2 to 9 inches per year. Geotechnical monitoring using inclinometers, piezometers, surface monuments, and seismic monitoring stations at various locations around the landfill provides additional information regarding the static and dynamic properties of the refuse prism and existing cover.

SITE HISTORY AND ENFORCEMENT ACTIVITIES

The original gas ROD contains a chronology of site enforcement activities through 1988. EPA has undertaken the following enforcement activities since September 1988:

May 1989	A Partial Consent Decree (CD) between the United States, the State of California, and approximately 120 Potentially Responsible Parties (PRPs) was entered in the District Court for the Central District of California, United States, et al v. Chevron Chemical, et al. The Partial Consent Decree resolved claims for some State and Federal past costs, EPA oversight costs, and the implementation of the first two operable units, Site Control and Monitoring and Leachate Management.
July 1989	EPA sent General Notice letters to approximately 91 additional PRPs representing an additional five percent by volume of the

manifested liquid wastes.

The generators noticed to date represent approximately 85% by volume of the manifested liquid waste.

March 1990 — EPA extended an offer to the 91 PRPs noticed in July 1989 and to previous nonsettlors for settlement of the same issues as the first CD (past costs to June 1, 1988, liability for the first two operable units, and EPA oversight cost for the two OUs). The offer closed August 3, 1990. The settlement will result in a Second Partial Consent Decree.

COMMUNITY PARTICIPATION

Pursuant to the requirements for public participation set forth in Sections 113(k)(2)(B)(i-v) and 117 of CERCLA, EPA conducted the following activities for the ROD amendment:

- EPA mailed the amended Proposed Plan (dated December 1989), to approximately 1600 interested parties. The amended Proposed Plan presented the preferred alternative of addition of landfill cover to the previously selected gas control remedy.

- A notice of the release and mailing of the Proposed Plan, the time and place of the public meeting, and the dates for the public comment period was published in the Los Angeles Times, San Gabriel edition, on December 15, 1989.

- The public comment period opened on December 11, 1989 and closed on January 12, 1990. Documents from the Administrative Record were placed in the site information repositories for public review during the comment period.

- On January 4, 1990, EPA held a public meeting at a high school near the site to discuss the alternatives evaluated, to present the amended preferred alternative, and to provide an opportunity for public comment. During this meeting EPA solicited written and verbal comments and provided responses to the comments. A transcript of the public meeting, including comments and responses, is part of the Responsiveness Summary for the ROD Amendment.

- EPA received two sets of written comments during the public comment period and addresses these comments in the attached Responsiveness Summary for the ROD

Amendment.

SUMMARY OF SITE CHARACTERISTICS

A summary of the site characteristics relating to the landfill gas control system is included in the original gas ROD. An additional discussion of site characteristics relating to landfill cover is presented below.

The OII landfill is divided by the Pomona Freeway into two areas, a south parcel and a north parcel. The south parcel is approximately 145 acres in size and is characterized by 43 acres of relatively flat top deck and 102 acres of sloped areas. The slopes have two to three intermediate bench roads, 10 to 12 feet wide, to allow access and slope maintenance. Total slope heights vary from 100 to 200 feet with average slope angles ranging from less than 4H:1V (Horizontal:Vertical) to as steep as 1.5H:1V. Locally, slopes do exceed 1.5H:1V in steepness. The majority of the 145-acre south parcel was used for waste disposal whereas approximately 15 acres of the western area of the north parcel were used for waste disposal.

The 145-acre south parcel of the landfill is bounded by the Pomona Freeway to the north, business and residential areas to the west and south, and an oil field to the east. The majority of the perimeter of the landfill abuts the freeway or residential areas which severely limits any expansion of the landfill boundaries to decrease the steepness of the slopes.

The maximum vertical thickness of the landfill on the south parcel is approximately 330 feet. The top of the landfill ranges from 70 to 225 feet above the adjacent ground surface with the elevation of the top deck averaging approximately 620 to 640 feet above mean sea level (msl). The lowest elevation of the bottom of the landfill is estimated to be approximately 300 feet above msl.

The landfill is currently covered by a soil layer of variable thickness which ranges from nearly 0 feet to 25 feet. The cover tends to be thicker on the top deck and thinner on the slopes and consists of varying amounts of clay, sand, and silt. The engineering characteristics of the cover are highly variable and, generally, are not adequate for landfill closure. Surface cracking, depressions, and evidence of erosion exist at many locations around the landfill. The primary deficiencies of the existing cover are that it does not: (1) prevent gaseous surface emissions; (2) prevent oxygen intrusion into the refuse; (3) limit infiltration of surface water; or (4) provide for adequate erosion control and stormwater management.

Landfill gas that is not adequately controlled by the gas control system or by the landfill cover currently in place is

released by venting through the landfill cover, resulting in unacceptable surface emissions of landfill gas on- and off-site. Excessive surface emissions have been documented by grid survey data from the landfill surface. On-site areas with the highest levels of surface emissions have historically been on the slopes. The slopes have a thinner existing cover and have experienced significant erosion which further increases the amount of gaseous surface emissions. As the landfill refuse settles, the resulting cracks and fissures also act as a preferential pathway for surface emissions.

Historically, subsurface fires have been a recurring problem at the OII landfill. These fires have resulted from oxygen intrusion in combination with the high temperatures created during anaerobic decomposition of the refuse. The negative pressure (vacuum) necessary for the operation of gas extraction wells draws oxygen through the surface of the landfill, providing a source of oxygen within the refuse. Another major source of oxygen is supplied by an air dike injection system on the western border of the landfill, designed by OII to inject a curtain of compressed air into the ground to create a barrier to subsurface LFG migration.

Evidence of subsurface fires (e.g., elevated gas well temperatures) has existed for several years in some areas of the landfill. These fires can produce voids within the landfill that, upon collapse, may result in surface settlement depressions and the release of landfill gas. The reduction of oxygen intrusion requires the replacement of the air dike system with gas extraction wells and/or a decrease of the gas extraction system vacuum. Merely decreasing the system vacuum, given the current inadequacy of the existing gas extraction system, would result in a significant and unacceptable increase in off-site gas migration.

Oxygen intrusion into the refuse has also lowered the percent combustibles of the gas stream in the landfill gas extraction system, which could subsequently reduce the destruction efficiency during incineration. In existing areas of thin cover, the vacuum system applied to the gas extraction wells has been decreased or shut off due to elevated temperatures or poor gas quality, thus reducing the radius of influence of the well and the volume of gas extracted. The placement of landfill cover facilitates the extraction of high-quality LFG and will allow the system to operate with maximum efficiency.

The existing landfill cover is highly variable in its thickness and permeability and in its ability to prevent surface water infiltration. The lack of adequate cover allows surface water from rainfall and site irrigation to percolate through the thin cover, cracks, or fissures into the refuse prism. Left uncontrolled, the liquids percolate through the refuse and

increase the amount of leachate in the landfill.

In addition to providing a physical barrier for gaseous surface emissions, oxygen intrusion, and surface water infiltration, the landfill cover forms the physical base for the stormwater management and erosion control systems at the landfill. The site drainage system currently consists of concrete-lined or clay-lined ditches along the toe of the intermediate slopes and on the top deck which drain to asphalt inlet and drop structures. Surface drainage is conveyed off-site in approximately ten locations around the south parcel. Substantial amounts of surface water are conveyed along the shoulder of access roads. Poor control of surface runoff has resulted in significant erosion of cover soil on slopes and access roads.

The existing drainage system is inadequate to prevent slope erosion and off-site sediment transport. An hydrologic analysis is being conducted as part of the Site Control and Monitoring (SCM) remedial action to assist in the design of a comprehensive stormwater management system. Improvements to the site drainage system conducted as part of SCM will be incorporated into the design and construction of the stormwater management system component of landfill cover.

SUMMARY OF SITE RISKS

A discussion of site risks is included in the original gas ROD. The Preliminary Risk Assessment for this operable unit demonstrated the need for landfill gas migration control and landfill cover to stabilize the site, to minimize further contaminant migration, and to quickly achieve significant risk reduction. The Preliminary Risk Assessment is found in Volume 1 Text, Public Comment Draft, Operable Unit Feasibility Study for Landfill Gas Migration Control, at page 4-10.

DESCRIPTION OF ALTERNATIVES

This amendment presents an additional alternative, Alternative 11, for evaluation and comparison with Alternatives 1 through 10 presented in the original gas ROD. The addition of this alternative is the result of public comment on the original gas ROD and additional site-specific knowledge now available to EPA as a result of its presence on-site performing a RI and conducting SCM for the last three years.

Alternative 11 consists of the landfill gas control remedy previously selected in the original gas ROD with the addition of design and construction of landfill cover. The Operable Unit Feasibility Study for Landfill Gas Migration Control, in conjunction with the "Technical Memorandum of Cost Estimates for Landfill Cover Concepts RI/FS," provides a thorough discussion of

the integrated gas control and landfill cover alternative. A summary of the components for Alternative 11 is included below.

TREATMENT COMPONENTS

Alternative 11 includes the treatment components specified for Alternatives 9 and 10 which were presented in the original gas ROD. Alternative 11 provides for the extraction and thermal destruction of an estimated 90 percent of the landfill gas produced by the landfill (original gas ROD, page 37). This represents a 78 percent reduction in the volume of methane gas currently being released from the site. The thermal destruction facility for the landfill gas will meet the 99.99 percent destruction efficiency as required by the Resource Conservation and Recovery Act (RCRA). Liquids (e.g., leachate and condensate) collected by the gas control system will be collected and treated in an on-site treatment plant currently being designed and constructed under the Leachate Management Operable Unit.

CONTAINMENT COMPONENTS

Alternative 11 amends the gas control remedy previously selected by adding the design and construction of landfill cover. The installation of landfill cover will further enhance the collection efficiency of the gas control system, thus reducing the potential for contaminant migration. The cover will be designed to meet applicable or relevant and appropriate requirements (ARARs) for landfill closure, including those under the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. § 6901, et seq. which defines general cover system performance standards, as well as more stringent promulgated State landfill cover requirements. The specific components for the cover will be developed during the remedial design stage.

Generally, the cover is designed to: (1) reduce gaseous surface emissions and associated odor; (2) minimize oxygen intrusion into the refuse; (3) reduce surface water infiltration and the subsequent formation of leachate; (4) minimize slope erosion; and (5) improve site aesthetics. Cover design options include characteristic components such as:

1) A base layer placed on the existing cover which acts as a foundation for the cover system;

2) A drainage layer (e.g., gravel, synthetic geogrid) to collect gas or liquids migrating to the surface of the landfill;

3) A barrier layer (e.g., clay, synthetic flexible membrane liner) to prevent gaseous surface emissions and surface water infiltration; and

4) A soil or synthetic layer to control erosion, prevent off-site sediment transport, and improve site aesthetics.

Test cover plots are currently being developed as part of the SCM activities. Information obtained as a result of the construction, operation, and maintenance of the test plots will facilitate the design and construction of a landfill cover which will effectively meet the RCRA cover system performance standards.

The 30-year present worth cost for the gas control system of $62,900,000 was presented in the original gas ROD. Capital costs, operation and maintenance costs, and present worth costs for the landfill cover are estimated in the "Technical Memorandum--Cost Estimates for Landfill Cover Concepts RI/FS," dated December 11, 1989. A range of potential cover designs were identified and evaluated in the Technical Memorandum. Based on the range of cost estimates for the gas control system plus the landfill cover, the 30-year present worth cost, discounted at 5%, for the gas control system and landfill cover is estimated at $125,300,000 to $181,300,000. Significant efficiencies should result from the integrated design and construction of the landfill gas collection system and cover, resulting in a reduction in capital and life-cycle costs.

SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

Tables 1 and 2 provide a summary of the relative performance of the alternatives, comparing present worth costs, effectiveness, and compliance with ARARs. Table 3 presents a more detailed evaluation of the effectiveness of the alternatives.

Table 1
ALTERNATIVES COMPARISON SUMMARY
OII LFG MIGRATION CONTROL

Alternative		Effectiveness			Cost Estimate (a)	
No.	Description	Innovative or Resource Recovery Technology	Estimated Additional LFG Collection (b)	Probability of Meeting or Exceeding ARARs	Capital Investment ($ Million)	Operation & Maintenance (c) ($ Million)
0.	No Action	No	-	No	0	0
1.	Status Quo	No	0%	No	0	1.6
2.	Improved Status Quo	No	0%	No	5.8	1.5
3.	Minimal Gas Extraction with LFG Flaring	No	0%	Partially	15.5	2.0
4.	Intermediate Gas Extraction with LFG Flaring	No	20%	Possibly	23.3	2.5
5.	Maximum Gas Extraction with LFG Flaring	No	45%	High Probability	32.1	3.0
6.	Maximum Gas Extraction with LFG Boiler and Steam Power Generation	Yes	70%	High Probability	46.6	3.4(d) / 3.0(e)
7.	Replacement Gas Extraction with LFG Flaring	No	70%	High Probability	45.3	2.6
8.	Replacement Gas Extraction with LFG Boiler and Steam Power Generation	Yes	70%	High Probability	59.8	1.0(d) / 2.6(e)
9.	Modified Replacement Gas Extraction with LFG Flaring	No	70%	High Probability	27.0	2.3
10.	North Parcel System	No	70%	High Probability	0.4	0.038
11.	Alternatives 9 and 10 with Landfill Cover	No	70% +	High Probability	68.4-118.3	3.7-4.1

Notes:

(a) Base costs are order-of -magnitude level estimates (i.e., the cost estimates have an expected accuracy of -30 to +50 percent).

(b) Percent increase over projected (based on LFG generation model) LFG collected in 1990 using existing LFG facilities.

(c) Operation/Maintenance, net estimated annual costs, 30 years unless noted specifically as (d) or (e), rounded off.

(d) Operation/Maintenance, net estimated annual costs, 0 10 years, rounded off.

(e) Operation/Maintenance, net estimated annual costs, 11-30 years, rounded off.

TABLE 2
Amended to Include Alternative 11

NET PRESENT WORTH OF ALTERNATIVES

Alternative	Project Life	Present Worth Rates (S in millions) @ 3%	@5%	@10% (interest)
1	30 years	31.1	24.4	15.0
	45 years	37.5	27.2	15.1
	60 years	41.4	28.3	14.9
2	30 years	35.3	29.0	20.0
	45 years	41.6	31.7	20.2
	60 years	45.5	32.9	20.2
3	30 years	54.1	45.7	34.0
	45 years	62.3	49.4	34.3
	60 years	67.6	51.1	34.3
4	30 years	71.5	61.1	46.5
	45 years	82.1	65.9	46.9
	60 years	88.8	68.1	46.9
5	30 years	90.0	77.5	60.0
	45 years	103.0	83.5	60.6
	60 years	111.2	86.2	60.6
6	30 years	94.0	82.2	67.7
	45 years	107.0	88.8	68.4
	60 years	115.3	91.5	68.4
7	30 years	96.1	85.2	69.8
	45 years	107.6	90.4	70.3
	60 years	114.9	92.9	70.3
8	30 years	100.2	90.5	77.5
	45 years	111.6	95.8	78.1
	60 years	119.0	98.0	78.1
9	30 years	71.6	61.9	48.4
	45 years	81.5	66.5	48.8
	60 years	87.9	68.6	48.9
10	30 years	1.1	1.0	0.8
	45 years	1.2	1.0	0.7
	60 years	1.2	1.0	0.7
11	30 years	140.9-198.7	125.3-181.3	103.3-157.0
	45 years	159.1-218.8	134.2-191.1	104.9-158.7
	60 years	170.8-231.8	138.4-195.9	105.3-159.2

Table 3*
EFFECTIVENESS EVALUATION OF ALTERNATIVES

1. Overall Protection of Human Health and the Environment

Effectiveness Criteria	Alternative 11
How Alternative Provides Human Health and Environmental Protection	• Landfill Gas normally released as surface emissions and subsurface migration will be reduced. • Greater reduction than Alternatives 9/10 through addition of landfill cover. • Cover enhances extraction well efficiency.

2. Compliance with ARARs

Effectiveness Criteria	Alternative 11
Compliance with Chemical-Specific ARARs	• Surface emissions control (less than 50 ppm average of methane; 500 ppm maximum at any point): Greater likelihood of compliance with addition of landfill cover than with Alternatives 9/10. • Subsurface migration control (less than 5 percent methane at boundary:): Greater likelihood of compliance by enhancing extraction system efficiency than with Alternatives 9/10.
Compliance with Action Specific ARARs	• Odor control: High potential for control of odorous surface emissions with maximum well coverage and landfill cover installation. • Thermal destruction facility will achieve a destruction and removal efficiency of 99.99%.
Compliance with Location-Specific ARARs	No location-specific ARARs apply.

3. Long-term Effectiveness and Permanence

Effectiveness Criteria	Alternative 11
Magnitude of Residual Risk	A quantitative residual risk calculation has not been performed for this operable unit. However, due to greater control of emissions and enhanced gas collection associated with Alternative 11, residual risk is less than that potentially posed by Alternatives 9/10. A quantitative residual risk analysis will be done as part of the final site remedy.

* Please see the attached ROD (9/30/88) for a complete evaluation of Alternatives 1-10.

4. Reduction of Toxicity, Mobility, or Volume Through Treatment

Effectiveness Criteria	Alternative 11
Degree of Expected Reduction in Toxicity, Mobility, and Volume	Placement of cover will allow the other components of the remedy outlined in Alternatives 9/10, (including the treatment component discussed in the original ROD) to work more efficiently. High potential for reduction due to maximum well coverage plus landfill cover.

5. Short-Term Effectiveness

Effectiveness Criteria	Alternative 11
Protection of Community During Remedial Actions	Short term risks posed by construction and/or surface emissions may exist, but will be mitigated by proper controls.
Environmental Impacts	Noise, LFG emissions, erosion, odors, and dust during construction will require engineering controls.
Protection of Workers during Remedial Actions	• Potential contact with hazardous substances may exist, and will require appropriate health and safety procedures. • Physical hazards may exist due to on-slope construction of gas/cover components.
Time Until Remedial Action Objectives are Achieved	• Integrating gas/cover systems gains efficiencies in ease and time of design and construction. Remedial action objectives should be met sooner than with Alternative 9/10. • Without integration, cover would require difficult retrofitting to gas system (e.g. extension of extraction wells). • Time required to implement integrated gas/cover will be longer than implementing gas exclusively but less than implementing gas plus a retrofitted cover.

6. Implementability

Effectiveness Criteria	Alternative 11
Ability to Construct and Operate the Technology	Integrated gas/cover systems are widely used for control of releases at landfills. Broad range of technologies available, both proven and innovative, for system design. Slope steepness will impact the ease with which the cover will be installed; however, this issue will be addressed by considering a variety of cover systems for different portions of the landfill.

Reliability of Technology	Integrated LFG/cover system is a demonstrated and widely-used landfill technology. A broad range of equipment and materials are available, have been used on other landfills, and will be evaluated during system design.
Ability to Monitor Effectiveness of Remedy	Same as Alternatives 9 and 10.
Ability to Obtain Approvals from Other Agencies	Same as Alternatives 9 and 10.

7. Cost

Effectiveness Criteria	Alternative 11
Capital Cost	Higher than Alternatives 9/10.
Operating and Maintenance Cost	Because the landfill cover will be installed together with the gas control components in Alternatives 9/10, it is likely there will be efficiencies gained in both operation and maintenance. Moreover, the original ROD contemplated a cover for the site, and O/M costs would be required for final remedy.
Present Worth Costs	Higher than Alternatives 9/10.

8. State Acceptance

Effectiveness Criteria	Alternative 11
Features of the Alternative the State Supports	State concurs with choice of remedy, and has not identified any features about which it has reservations.

9. Community Acceptance

Effectiveness Criteria	Alternative 11
Features of the Alternative the Community Supports	Community concurs with choice of remedy, and has not identified any features about which it has reservations.

STATE ACCEPTANCE

EPA and the State of California, Department of Health Services, agree on the preferred alternative. Both Agencies have been involved in the technical review and the development of the Proposed Plan. The Department of Health Services issued a Negative Declaration on April 9, 1990 for the Gas Migration Control with Landfill Cover Operable Unit in compliance with the requirements of the California Environmental Quality Act (CEQA).

COMMUNITY ACCEPTANCE

During the public comment period, EPA received two sets of written comments from the community.

1) A local community group Homeowners to Eliminate Landfill Problems (H.E.L.P.) concurs with the preferred alternative to amend the ROD to add landfill cover to the gas remedy.

2) The OII Steering Committee, a group of potentially responsible parties involved at OII, supports the consideration of integration of the cover component of the site remedy with the gas control remedy, but expressed concern about the lack of specificity regarding the exact type of cover design to be implemented. Detailed responses to the issues raised by the OII Steering Committee are included in the Responsiveness Summary section of the ROD.

A transcript of the public meeting, including public statements made during the meeting, is also included in the Responsiveness Summary.

SELECTED REMEDY/STATUTORY DETERMINATIONS

The selected remedy, Alternative 11, for this ROD amendment integrates the design and construction of landfill cover with the landfill gas control remedy previously selected in the original gas ROD. The major components of the amended landfill gas control and cover remedy include:

- Landfill cover designed to: (1) reduce surface gas emissions and odors; (2) prevent oxygen intrusion into the refuse; (3) prevent surface water infiltration; (4) provide erosion control; and (5) to improve site aesthetics;

- Perimeter LFG extraction wells, with placement focused on minimizing off-site LFG migration;

- o LFG extraction wells on the top deck of the landfill, with placement focused on maximizing source control of LFG;

- o Shallow and deep slope wells with placement focused on reducing surface emissions and controlling intermediate to deep subsurface migration at the perimeter;

- o Integrated above-grade LFG headers and condensate sumps;

- o LFG monitoring wells at the site boundary;

- o Upgraded thermal destruction facility for landfill gas; and

- o Pumps in appropriate gas wells, with above-grade collection sumps, to de-water saturated zones.

The addition of landfill cover to this operable unit significantly increases the protection of human health and the environment and will be designed to attain ARARs or a waiver is justified.

PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT

The selected remedy protects human health and the environment through extraction and thermal destruction of landfill gas and installation of landfill cover. The thermal destruction will permanently remove 99.99 percent of the contaminants in the landfill gas. The landfill cover will be designed to reduce surface gas emissions and odors; prevent oxygen intrusion into the refuse, which will allow the gas systems to work more effectively; prevent surface water infiltration, which will assist in leachate management; and promote erosion control.

Short-term risks associated with the selected remedy, as addressed in the original gas ROD (at page 31), can be readily controlled. In addition, no adverse cross-media impacts are expected from the remedy.

COMPLIANCE WITH ARARs

The selected amended remedy for the landfill gas migration control and landfill cover operable unit will be designed to attain the following applicable or relevant and appropriate requirements (ARARs), in addition to the ARARs identified in the original gas ROD. These ARARs were identified from Federal, and more stringent promulgated state and local environmental and public health laws.

The amended remedy is an operable unit which only addresses landfill gas migration control and landfill cover. While certain closure and post-closure requirements are applicable, this remedial action does not address all closure and post-closure ARARs. Upon conclusion of the Remedial Investigation and Feasibility Study, additional remedial actions may be selected. EPA currently expects that further actions, including groundwater remediation, may be required. The ARARs for such remedial actions will be identified and addressed at that time.

Federal Requirements

1. **Resource Conservation and Recovery Act (RCRA)**

The Resource Conservation and Recovery Act (RCRA), Subtitle C, sets forth several applicable requirements for the amended remedy at 40 C.F.R. Part 265, Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities, and several relevant and appropriate requirements in 40 CFR part 264, Standards for Owners and Operators of Hazardous Waste Treatment, Strorage and Disposal Facilities.

The Land Disposal Restrictions of RCRA are neither applicable, nor relevant and appropriate to this remedial action. Generally, any movement of hazardous waste will be within the same area of contamination. There will be no residuals from the thermal destruction facility to be redeposited, and any condensate or leachate will be treated on site at the treatment plant currently being designed and constructed under the Leachate Management operable unit.

A. Part 265, Subpart G: Closure and Post-Closure

40 C.F.R. § 265.117: Post-closure care and use of property

Post-closure care requirements must begin after closure of the unit and continue for 30 years after that date. These requirements include (c): post-closure use of the property on or in which hazardous wastes remain after partial or final closure must never be allowed to disturb the integrity of the cover.

B. Part 265, Subpart N: Landfills

40 C.F.R. § 265.310 - Closure and Post-Closure Care

The final landfill cover must be designed and constructed to: (1) provide long-term minimization of migration of liquids through the closed landfill; (2) function with minimum maintenance; (3) promote drainage and minimize erosion or abrasion of the cover; (4) accommodate settling and subsidence so

that the cover's integrity is maintained; and (5) have a permeability less than or equal to any bottom liner system or natural subsoils present.

The 30 year post-closure care of the cover must include: (1) maintenance of the integrity and effectiveness of the cover, including repairs to the cover as necessary to correct the effects of settling, subsidence, erosion or other events; (2) prevention of run-on and run-off from eroding or otherwise damaging the cover; and (3) protection and maintenance of surveyed benchmarks.

C. Part 264, Subpart O: Incinerators

Several of the sections of this subpart are relevant and appropriate requirements for the thermal destruction facility, which meets the RCRA definition of an "incinerator," namely an enclosed device using controlled flame combustion to incinerate hazardous waste.

40 C.F.R § 264.343 - Performance Standards

The remedy will be designed to attain the standards required by this section. The thermal destruction facility must be designed, constructed and maintained to meet the following performance standards:

(1) the facility must achieve a destruction and removal efficiency of 99.99 percent for each principal organic hazardous constituent in the waste feed;

(2) the facility must reduce hydrogen chloride emissions to 1.8 kg/kr or 1 percent of the HCl in the stack gasses before entering any pollution control devices; and

(3) the facility must not release particulate in excess of 180 mg/dscm corrected for the amount of oxygen in stack gas.

40 C.F.R § 264.345 - Operating Requirements

The thermal destruction facility will be operated to meet the following requirements of this section: (1) monitoring of various parameters during operation, including, combustion temperature, waste feed rate, an indicator of combustion gas velocity, and carbon monoxide; (2) control of fugitive emissions by (a) keeping the combustion zone totally sealed against fugitive emission, (b) maintaining combustion-zone pressure lower than atmospheric pressure, or (c) controlling via an alternate means to provide fugitive emissions control equivalent to maintenance of combustion zone pressure lower than atmospheric pressure; and (3) utilization of an automatic cutoff system to stop waste feed when operating conditions deviate.

2. Clean Water Act (CWA)

Clean Water Act National Pollutant Discharge Elimination System (NPDES): 40 C.F.R. Part 125 sets forth requirements for permits for the discharge of pollutants from any point source into waters of the United States. Minimization of the off-site transport of materials and debris to meet the substantive portion of the NPDES permit requirements will be addressed during the Remedial Design phase in the development of the landfill cover grading plan and the design of the site stormwater management and drainage structures.

State Requirements

The State of California has timely identified several ARARs which are applicable to the amended selected remedy in addition to the ARARs identified in the original gas ROD. Moreover, the selected remedy will meet ARARs, as noted below, for which interim waivers were invoked in the original gas ROD pending the addition of landfill cover.

1. South Coast Air Quality Management District, Rules and Regulations (administered by the South Coast Air Quality Management District, as delegated by the California Air Resources Board).

Rule 402 - Nuisance. This rule prohibits the discharge of any material (including odorous compounds) that cause injury, detriment, nuisance, or annoyance to the public, businesses, or property or endangers human health, comfort, repose or safety. The selected amended remedy will be designed to attain this ARAR, waived in the original gas ROD.

Rule 432.1 - A typographical error in the original ROD identified this Rule as 431.1.

Regulation XI - Source Specific Standards - 1150.2

The original gas ROD identified Rule 1150.1, Control of Gaseous Emissions from Active Landfills, as an ARAR for the selected remedy and waived this requirement pending selection of landfill cover. The cover selected by this amended remedy will be designed to meet Rule 1150.2, Control of Gaseous Emissions from Inactive Landfills, which is an applicable state requirement.

Rule 1150.2 - Control of Gaseous Emissions from Inactive Landfills, requires perimeter landfill gas monitoring probes to evaluate off-site migration and limits concentration to total organic compounds to 50 ppm over a representative area of the landfill and maximum concentration of organic compounds (measured

as methane) to 500 ppm, at any point on the surface of the landfill.

2. **Solid Waste Management and Resource Recovery Act of 1972** (administered by the California Integrated Waste Management Board). The following titles of this act are applicable to the landfill cover component of the selected amended remedy.

A. **Title 14, California Code of Regulations, Division 7**

The following sections of Chapter 3, Minimum Standards of Solid Waste Handling and Disposal, Article 7.8, Disposal Site Closure and Postclosure, are applicable to landfill cover.

1. **Section 17773 - Final Cover**

The regulation is applicable and the cover will be constructed to meet its requirements. This regulation requires that a minimum thickness and quality of cover be placed over the entire surface of the final lift which meets the standards of Title 23, CCR, Subchapter 15, Section 2581 or that meet the standards set forth for an engineered alternative. The prescriptive standard must be not feasible and the alternative must be consistent with the performance goals of subsection (e) and afford equivalent protection against water quality impairment. Subsection (d) provides the basis for showing compliance with this standard is not feasible.

Subsection (e) sets forth the following minimum performance goals for the thickness and quality of cover: (1) a need to limit infiltration of water, to the greatest extent possible; (2) a need to control landfill gas emissions; (3) the future reuse of the site; and (4) a need to protect the low permeability layer from desiccation, penetration by rodents, and heavy equipment damage.

2. **Section 17783 - 17783.15**

These sections are applicable to the amended selected remedy, and it will be designed to attain these requirements. These regulations became effective August 1989 and were not promulgated at the time the gas ROD was originally signed. However, the remedy both as originally selected and as amended, will meet these ARARs.

a. **Section 17783 - Gas Monitoring and Control During Closure and Postclosure**

During periods of closure and postclosure maintenance, landfill gases generated at the facility must be controlled as follows:

(1) The concentration of methane gas must not exceed 1.25% by volume in air within on-site structures;

(2) The concentration of methane gas migrating from the landfill must not exceed 5% by volume in the air at the facility property boundary or an alternative boundary in accordance with Section 17783.5.

(3) Trace gases shall be controlled to prevent adverse acute and chronic exposure to toxic and/or carcinogenic compounds.

Subsection (b) sets forth the period during which monitoring should continue and subsection (d) provides that the monitoring and control systems shall be modified, during the closure and postclosure maintenance period to reflect changing on-site and adjacent land uses. Postclosure land use at the site shall not interfere with the function of gas monitoring or control systems.

b. **Section 17783.3 - Monitoring**

This section requires that the gas monitoring system shall be designed to meet with the specified site characteristics, and potential migration pathways or barriers, including, but not limited to: (1) local soil and rock conditions; (2) hydrogeological conditions at the facility; (3) locations of buildings and structures relative to the waste deposit area; (4) adjacent land use, and inhabitable structures within 1000 feet of the landfill property boundary; (5) man-made pathways, such as underground construction; and (6) the nature and age of waste and its potential to generate landfill gas.

c. **Section 17783.5 - Perimeter Monitoring Network**

This section sets forth specific requirements for the location (subsection a), spacing (subsection b), depth (subsection c) and construction (subsection d) of the monitoring wells.

d. **Section 17783.7 - Structure Monitoring**

This section requires that the design of the monitoring system include provisions for monitoring on-site structures, identifies some methods for monitoring such structures, and requires that structures located on top of the waste deposit area be monitored on a continuous basis.

e. **Section 17783.9 - Monitoring Parameters**

This section requires that all monitoring probes and on-site structures be sampled for methane and for specified trace gases, when there is a possibility of acute or chronic exposure due to carcinogenic or toxic compounds.

f. **Section 17783. 11 - Monitoring Frequency**

This section requires a minimum of quarterly monitoring with more frequent monitoring required if results indicate the landfill gas is migrating or accumulating in structures.

g. **Section 17783.15 - Control**

Subsection (a)(1) requires that all immediate steps be taken when the results of gas monitoring indicate levels of methane in excess of the compliance levels required by Section 17783(a).

Subsection (b) requires that the gas control system be designed to: (1) prevent methane accumulation in on-site structures; (2) reduce methane concentrations at monitored property boundaries to below compliance levels; (3) reduce trace gas concentrations; (4) provide for the collection and treatment and/or disposal of landfill gas condensate at the surface.

Subsection (c) indicates that the gas control systems may include, but are not limited to, the control systems enumerated in subsections (c)(1), (2) and (3).

Subsection (d) provides steps to be taken in the event on-site structure methane levels exceed that specified in Section 17783(a).

Subsection (e) requires that the operator provide for system monitoring and adjustment to ensure that the gas control system is operating at optimum efficiency.

3. **Section 17796 - Postclosure Land Use**

This regulation sets forth requirements concerning postclosure land use. Subsections (c), (d) and (e) are applicable to this remedial action. Subsection (c) requires that construction improvements on the site shall maintain the integrity of the final cover and the function of the monitoring system(s). Subsection (d) sets forth conditions to be met for construction of structural improvements on top of landfilled areas during the post-closure period. Subsection (e) sets forth building conditions pertaining to on-site structures constructed within 1,000 feet of the waste holding area.

B. **Title 22, California Code of Regulations**

Article 18: General Facility Standards

Section 67108: Seismic and Precipitation Design Standards

This section is applicable to the landfill cover component

and requires the design of cover systems and drainage control to function without failure when subjected to capacity, hydrostatic and hydrodynamic loads resulting from a 24-hour probable maximum precipitation storm. Additionally, all covers and cover systems which will remain after closure must be designed, constructed and maintained to withstand the maximum credible earthquake without the level of public health and environmental protection afforded by the original design being decreased.

Article 23 - Closure and Post-closure for Interim Status and Permitted Facilities

Section 67211 - Closure Performance Standard

Subsection (b) of this section is applicable to the selected amended remedy and requires that the facility be closed in a manner which controls, minimizes, or eliminates, to the extent necessary to protect human health and the environment, post-closure escape of hazardous waste, hazardous waste constituents, leachate, contaminated rainfall, or waste decomposition products to the ground or surface waters or to the atmosphere. As noted above, this operable unit does not address all aspects of closure; to the extent not addressed by this or earlier operable units, these will be addressed by subsequent remedial actions.

Article 29 - Landfills at Both Interim Status and Permitted Facilities

Section 67418 - Closure and Post-Closure Care of Landfills at Interim Status Landfills

This section requires the design and construction of final cover to meet certain standards which are equivalent to those set forth under RCRA. More stringent, applicable requirements include, subsection (1) which requires the prevention of downward entry of water into the closed landfill throughout a period of at least 100 years, and subsection (5) which requires that the cover be designed and constructed to accommodate lateral and vertical shear forces generated by earthquakes so that the integrity of the cover is maintained.

C. **Title 23, California Code of Regulations**

Chapter 3, State Water Resources Control Board
Subchapter 15 - Discharges to Land

Three sections of this subchapter are applicable. For the purposes of applying these regulations, the OII Site is considered to be a Class I facility. (See Section 2531(a)(2) of this Title.)

1. **Section 2546: Precipitation and Drainage Controls**

Subsection (a) requires that the cover shall be designed and constructed to limit, to the greatest extent possible, ponding, infiltration, inundation, erosion, slope failure, washout and overtopping under probable maximum precipitation conditions.

Subsection (c) requires diversion and drainage facilities to be designed and constructed to accommodate the anticipated volume of precipitation and peak flows from surface run-off under probable maximum precipitation conditions.

Subsection (d) requires collection and holding facilities associated with precipitation and drainage control systems to be emptied immediately following each storm or otherwise managed to maintain the design capacity of the system.

Subsection (e) requires surface and subsurface drainage from outside of a waste management unit to be diverted from the waste management unit.

Subsection (f) requires cover materials to be graded to divert precipitation from the waste unit, to prevent ponding of surface water over wastes, and to resist erosion as a result of precipitation with the return frequency specified in Table 4.1.

2. **Section 2547: Seismic Design**

This section requires structures which control surface drainage, erosion or gas shall be designed to withstand the maximum credible earthquake without damage.

3. **Section 2581: Landfill Closure Requirements**

The requirements of subsection (a) for cover are applicable. This section requires at least two feet of appropriate materials, (primarily soil-type materials) as a foundation layer and an additional one foot of soil on top of this foundation layer. These requirements will not be met by the selected remedy, and are being waived pursuant to Section 121(d)(4)(B), (C) and (D), 42 U.S.C. § 9621 (d)(4)(B), (C) and (D). Due to the configurations of the OII site, including its steep slopes and direct proximity to both homes and the Pomona freeway, a cover constructed of soil-type materials and with the thickness required by this subsection would result in a greater risk to human health and the environment than the selected remedy. Construction for such a cover is technically impracticable from an engineering perspective; far greater flexibility in types of materials and cover design is required by this site. The remedy selected will attain a standard of performance that is equivalent to that required by this section through an alternative approach which provides for a variety of cover materials.

The landfill cover component will be designed to attain the requirements of Sections 2581(b) and (c). Subsection (b) sets forth grading requirements which provide that closed landfills will be graded and maintained to prevent ponding and sets forth conditions specific to the steepness of slopes. Subsection (c) requires that the surface water be monitored in accordance with Article 5 of this Section.

COST-EFFECTIVENESS

Of the alternatives evaluated, the selected remedy provides the highest level of protection of human health and the environment in a cost-effective manner. Significant technical and economic efficiencies will be gained from the integrated design and construction of the landfill gas collection system and landfill cover.

UTILIZATION OF PERMANENT SOLUTIONS AND ALTERNATIVE TREATMENT TECHNOLOGIES OR RESOURCE RECOVERY TECHNOLOGIES TO THE MAXIMUM EXTENT PRACTICABLE

EPA believes the selected remedy represents the maximum extent to which permanent solutions and treatment technologies can be used for this operable unit at the OII site. Of those alternatives that are protective of human health and the environment and comply with ARARs, EPA has determined the selected remedy provides the best balance in terms of long-term effectiveness and permanence, reduction in toxicity, effectiveness, and reduction in volume achieved through treatment, short term effectiveness, implementability, and cost while considering the statutory preference for treatment as a principal element as well as community input.

Alternative 11 reduces the toxicity, mobility, and volume of the contaminants in the landfill gas, complies with ARARs, or a waiver is justified, provides short-term effectiveness, and protects human health and the environment more effectively and more rapidly than any of the other alternatives considered. The selected remedy is more reliable and can be implemented with less difficulty than implementation of gas control and landfill cover separately, and is therefore determined to be the most appropriate and cost-effective remedy for this operable unit at the OII site.

PREFERENCE FOR TREATMENT AS A PRINCIPAL ELEMENT

By treating the landfill gas using thermal destruction, the selected remedy satisfies the statutory preference for remedies that employ treatment of the principal threat which permanently and significantly reduces toxicity, mobility, or volume of hazardous substances as a principal element. The addition of landfill cover will further increase the efficiency of the gas

control system by reducing surface emissions and preventing oxygen intrusion into the refuse. Complete treatment of the refuse at this landfill is impracticable due to severe implementability problems, the potential for significant short-term risks, and prohibitive costs.